

WHAT IS CLAIMED IS:

1. An ink jet recording apparatus comprising:
 - a recording head for discharging ink from a plurality of discharge ports and recording onto a recording medium;
 - a carriage on which said recording head is mounted and which reciprocatively scans on said recording medium;
 - recording medium conveying means for conveying said recording medium in the direction perpendicular to a scanning direction of said carriage by a predetermined distance each time said carriage reciprocatively scans on said recording medium;
 - an ink tank mounted at a position where it does not exercise an influence on the reciprocal scan of said carriage and the conveyance of said recording medium by said recording medium conveying means;
 - an ink supply tube for supplying the ink from said ink tank to said recording head; and
 - control means for controlling an ink discharge state of said recording head on the basis of an image signal which is inputted from an upper apparatus, wherein said control means adjusts a scanning speed of said carriage so as to suppress an increase in negative pressure in said supply tube.
2. An ink jet recording apparatus comprising:

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- a recording head for discharging ink from a plurality of discharge ports and recording onto a recording medium;
- a carriage on which said recording head is
- 5 mounted and which reciprocatively scans on said recording medium;
- recording medium conveying means for conveying said recording medium in the direction perpendicular to a scanning direction of said carriage by a
- 10 predetermined distance each time said carriage reciprocatively scans on said recording medium;
- an ink tank mounted at a position where it does not exercise an influence on the reciprocal scan of said carriage and the conveyance of said recording
- 15 medium by said recording medium conveying means;
- an ink supply tube for supplying the ink from said ink tank to said recording head; and
- control means for controlling an ink discharge state of said recording head on the basis of an image
- 20 signal which is inputted from an upper apparatus,
- wherein said control means adjusts a non-recording time as a time during which no ink is discharged from said recording head so as to recover a pressure in said supply tube.
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3. An ink jet recording apparatus comprising:
- a recording head for discharging ink from a

plurality of discharge ports and recording onto a recording medium;

a carriage on which said recording head is mounted and which reciprocatively scans on said
5 recording medium;

recording medium conveying means for conveying said recording medium in the direction perpendicular to a scanning direction of said carriage by a predetermined distance each time said carriage
10 reciprocatively scans on said recording medium;

an ink tank mounted at a position where it does not exercise an influence on the reciprocal scan of said carriage and the conveyance of said recording medium by said recording medium conveying means;

15 an ink supply tube for supplying the ink from said ink tank to said recording head; and

control means for controlling an ink discharge state of said recording head on the basis of an image signal which is inputted from an upper apparatus,

20 wherein said control means adjusts the number of overlap recording scanning times of said carriage so as to recover a pressure in said supply tube.

4. An apparatus according to claim 1, wherein a
25 pressure smoothing tank which can store the ink of a predetermined capacity is arranged between said supply tube and said recording head in order to

suppress the increase in negative pressure in said supply tube.

5. An apparatus according to claim 4, wherein
5 the capacity of said pressure smoothing tank is equal
to or larger than 1 cc.

6. An apparatus according to claim 1, wherein
when the number of dots to be discharged of the ink
10 which is discharged from said recording head per unit
time, in which said number has been calculated from
said image signal, is equal to or larger than a
reference discharge number, said control means
determines that the negative pressure in said supply
15 tube has increased.

7. An apparatus according to claim 6, wherein
when a print duty is equal to a predetermined value,
said reference discharge number is equal to a
20 discharge number in which it has previously been
confirmed that no recording variation occurs.

8. An apparatus according to claim 6, wherein
said reference discharge number is equal to a
25 reference discharge number calculated on the basis of
an ink flow rate and a presumed negative pressure
calculated by a predetermined pressure calculating

equation.

9. An apparatus according to claim 4, wherein
the increase in negative pressure in said tube is
5 detected by a pressure sensor provided in said
pressure smoothing tank.

10. An apparatus according to claim 1, further
comprising recovery means for recovering a discharge
10 state of the ink of said recording head to a good
state by forcedly discharging the ink from each
discharge port of said recording head.

11. An apparatus according to claim 1, wherein
15 said recording head has an electrothermal converting
element for converting an electric energy into a
thermal energy and discharges the ink by using a film
boiling that is caused in the ink by the thermal
energy which is applied by said electrothermal
20 converting element.

12. An ink jet recording method in a recording
control method for an ink jet recording apparatus
comprising:
25 a recording head for discharging ink from a
plurality of discharge ports and recording onto a
recording medium;

a carriage on which said recording head is mounted and which reciprocatively scans on said recording medium;

- recording medium conveying means for conveying
5 said recording medium in the direction perpendicular to a scanning direction of said carriage by a predetermined distance each time said carriage reciprocatively scans on said recording medium;

- an ink tank mounted at a position where it does
10 not exercise an influence on the reciprocal scan of said carriage and the conveyance of said recording medium by said recording medium conveying means;

- 15 an ink supply tube for supplying the ink from said ink tank to said recording head; and control means for controlling an ink discharge state of said recording head on the basis of an image signal which is inputted from an upper apparatus,

- wherein said method has a step of reducing a scanning speed of said carriage when the number of
20 dots (to be discharged) of the ink which is discharged from said recording head per unit time, in which said number has been calculated from said image signal, is equal to or larger than a reference discharge number.

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13. An ink jet recording method in a recording control method for an ink jet recording apparatus

comprising:

a recording head for discharging ink from a plurality of discharge ports and recording onto a recording medium;

5 a carriage on which said recording head is mounted and which reciprocatively scans on said recording medium;

recording medium conveying means for conveying said recording medium in the direction perpendicular
10 to a scanning direction of said carriage by a predetermined distance each time said carriage reciprocatively scans on said recording medium;

an ink tank mounted at a position where it does not exercise an influence on the reciprocal scan
15 of said carriage and the conveyance of said recording medium by said recording medium conveying means;

an ink supply tube for supplying the ink from said ink tank to said recording head; and

control means for controlling an ink discharge
20 state of said recording head on the basis of an image signal which is inputted from an upper apparatus,

wherein said method has a step of extending a non-recording time as a time during which no ink is discharged from said recording head when the number
25 of dots (to be discharged) of the ink which is discharged from said recording head per unit time, in which said number has been calculated from said image

signal, is equal to or larger than a reference discharge number.

14. An ink jet recording method in a recording control method for an ink jet recording apparatus comprising:

a recording head for discharging ink from a plurality of discharge ports and recording onto a recording medium;

10 a carriage on which said recording head is mounted and which reciprocatively scans on said recording medium;

recording medium conveying means for conveying said recording medium in the direction perpendicular to a scanning direction of said carriage by a predetermined distance each time said carriage reciprocatively scans on said recording medium;

an ink tank mounted at a position where it does not exercise an influence on the reciprocal scan 20 of said carriage and the conveyance of said recording medium by said recording medium conveying means;

an ink supply tube for supplying the ink from said ink tank to said recording head; and

control means for controlling an ink discharge 25 state of said recording head on the basis of an image signal which is inputted from an upper apparatus, wherein said method has a step of increasing

the number of overlap recording scanning times of
said carriage when the number of dots (to be
discharged) of the ink which is discharged from said
recording head per unit time, in which said number
5 has been calculated from said image signal, is equal
to or larger than a reference discharge number.

15. A method according to claim 12, wherein
said reference discharge number is equal to a
10 reference discharge number calculated on the basis of
an ink flow rate and a presumed negative pressure
calculated by a predetermined pressure calculating
equation.